

CAXperts

3D PDF Engine

Reference Guide



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1 Introduction

3D PDF Engine creates PDF documents with 3D content out of Intergraph SmartPlant Review.

1.1 General conventions




This document contains many visual cues to help you understand the meaning of certain words or phrases. The use of different fonts for different types of information allows you to scan the document for key concepts or commands. Symbols help abbreviate and identify commonly used words, phrases, or groups of related information

Typefaces

<i>Italic</i>	Indicates a system response, which is an explanation of what the software is doing. For example, <i>The text is placed in the viewing plane.</i>
Bold	Indicates a command name, parameter name, or dialog box title. Command paths are shown using an arrow between command names. For example, Choose File → Open to load a new file.
Sans serif	Indicates a system prompt or message, which requires an action be taken by the user. For example, Select first segment of alignment
Normal typewriter	Indicates an actual file or directory name. For example, The ASCII report is stored in the layout.rpt file.
Bold typewriter	Indicates what you literally type in. For example, Key in original.dat to load the ASCII file.

Symbols

This document uses the following symbols to identify special information:

-  Note – important supplemental information.
-  Map or path – shows you how to get to a specific command or form.
-  More information – indicates there is additional or related information.

2 Installation

2.1 Setup

Requirements:

- Supported operating systems:
 - Microsoft Windows XP
 - Microsoft Windows Server 2003
 - Microsoft Windows Vista
 - Microsoft Windows 7
- Intergraph SmartPlant Review 2008 or later
- Microsoft .NET Framework 2.0
- Adobe Reader 9 or later

Administrator rights are required on each computer to install CAXperts **3D PDF Engine**. “Run as” is not supported.

Uninstall

To uninstall the software, select **Control panel** from the start menu. Then on

- Windows 7: in large or small icon view, click **Programs and features**. If you're using category view, under **Programs**, click **Uninstall a program**.
- Windows Vista: in classic view, double-click **Programs and features**. In control panel home view, under **Programs**, click **Uninstall a program**.
- Windows XP/2000: (Double) click the **Add or remove programs** icon.

Select the program you want to remove, and click Uninstall/Remove. Alternatively, right-click the program and select **Uninstall**.

Setup command line (for administrators)

The following command line options are supported by the installer:

/S

Allow an install/uninstall to be run in silent mode. As a result, no screens or dialogs will be shown.

For example:

```
"C:\output\setup.exe" "/S"
```

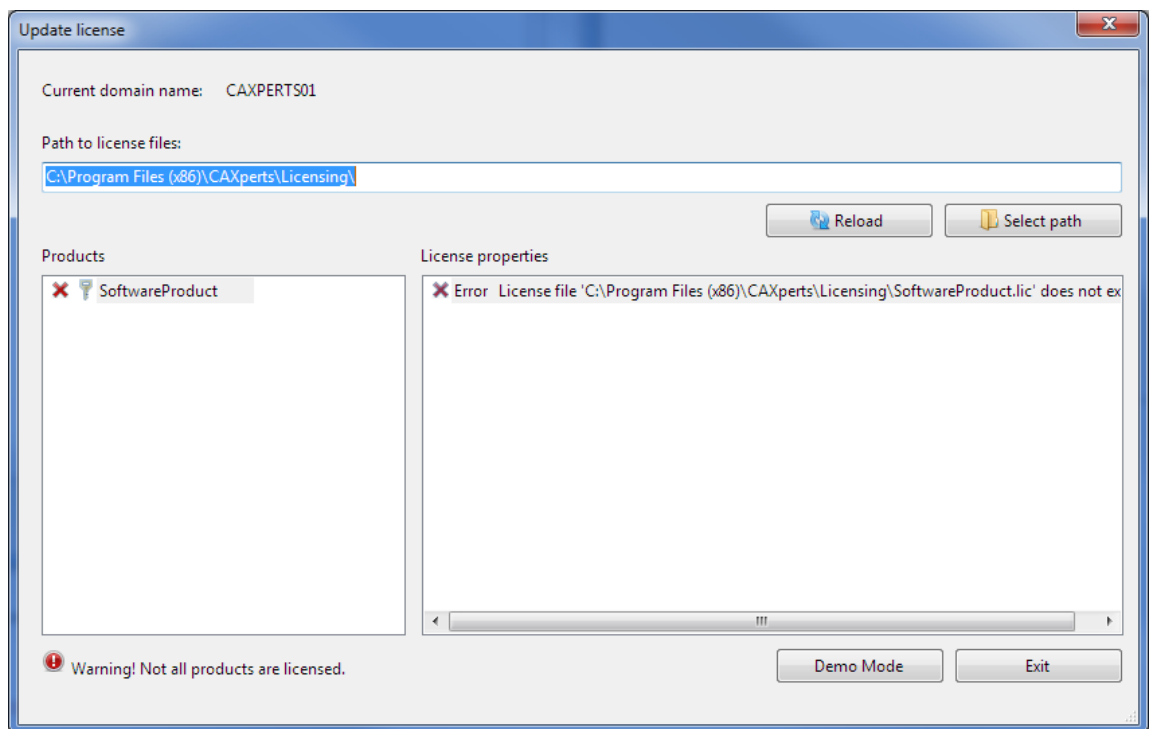
/U:<<XML config file>>

This command line option must be used when calling the uninstall program from the command line. This command also has an optional XML file that can be passed containing session variable values. For example:

```
"C:\Program Files\MyProduct\uninstall.exe" "/U:C:\Program Files\MyProduct\irunin.xml"
```

2.2 Licence

Once the setup has been completed and the program is started, a licence key will be requested as shown below.



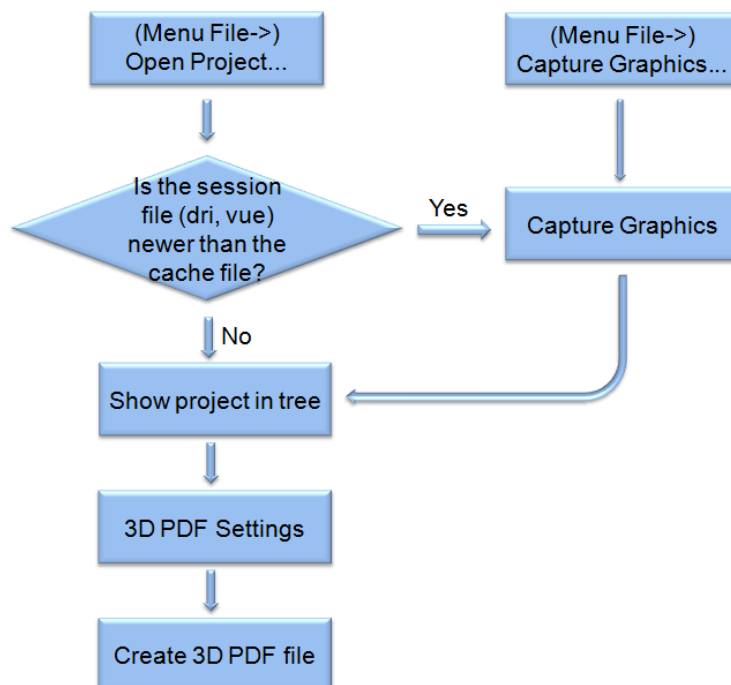
CAXperts will need your **Current domain name** to issue a licence file (.lic).

Please place this licence file into the folder where **Path to licence files** points to, then press **Reload**.

You can also set the **Path to licence files** to a different folder (e.g. a shared folder on a file server) using **Select path**.

3 First steps

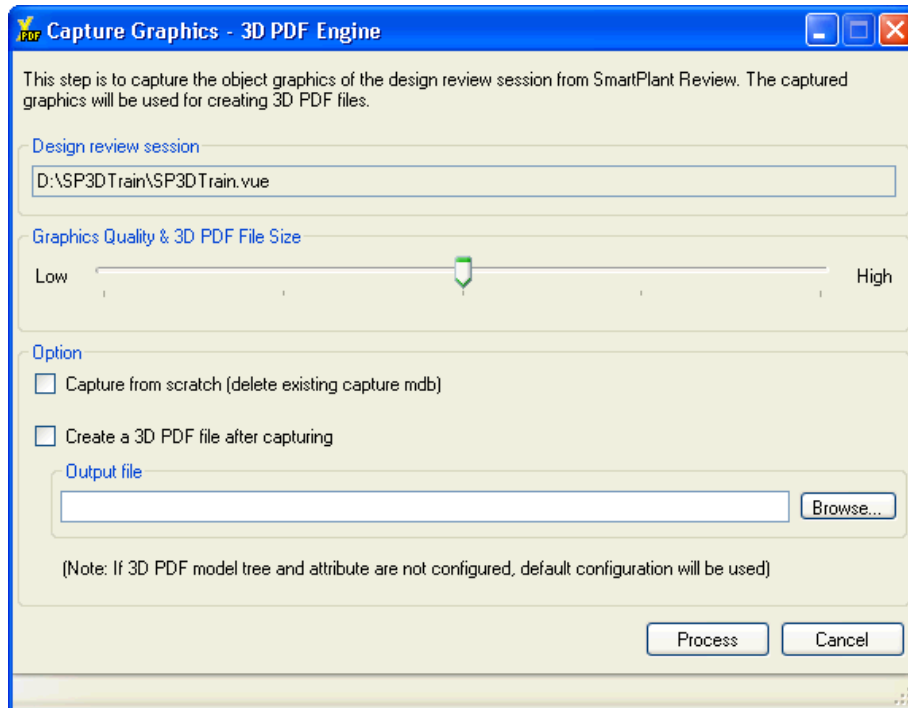
The workflow of **3D PDF Engine** is shown on the following diagram:




3D PDF Engine loads a design review session, opens the session with SmartPlant Review and captures the graphics of the design review session. The captured graphics will be saved in an mdb file (here called cache file). After capturing the graphics, the project tasks/disciplines and attributes will be shown on a tree view. The user can then configure the tree hierarchy and attributes for the export to 3D PDF files.

3.1 Capture graphics from design review sessions

Start the **Capture graphics** dialogue from **File** → **Capture graphics** (or from **File** → **Open project**, if the session was never captured):



 Note: This process might take several hours for large design review sessions. For the example Madison plant of SmartPlant 3D it will take about ten minutes.

There are the following limitations while capturing the graphics of the design review session:

- **SmartPlant Review** is not allowed to be minimised
- **SmartPlant Review** should not be hidden under other windows
- Only the “Main View” may be open in **SmartPlant Review**
- Only **SmartPlant Review** 2008 or later is supported
- The Windows screen saver should be turned off
- The computer is not allowed to be locked

 Note: While capturing, Windows screensavers will be switched off.

The file size of the output PDF depends also on the quality of the graphics. Use the slider bar to choose between small file size and low graphics quality or big file size and high graphics quality.

While processing the **SmartPlant Review** window will be maximised. The window state of **SmartPlant Review** may be changed to normal, but the window size should not be too small. The window size of **SmartPlant Review** also affects the quality of captured graphics.

Option **Capture from scratch** means if a session is already captured, the captured .mdb file (*_cache.mdb) will be deleted before recapturing. If the option is not turned on, only updated objects will be recaptured.

Use the option **Create a 3D PDF file after capturing** to create a PDF file after capturing the graphics.

3.2 Advanced configuration for capturing graphics

This chapter is for advanced users. You may ignore this chapter if advanced configuration is not required. Using an .ini file, users can define custom object types and rules for how **3D PDF Engine** should handle these objects.

Number of objects

The file size of the resulting PDF file depends noticeably on the number of objects captured. Ignoring less-meaningful objects (e.g. welds in **SmartPlant 3D** sessions) is one approach for reducing the overall 3D PDF file size.

The following syntax is used to define a custom object type in the .ini file:

```
[ObjectDefinition]
```

```
ObjectTypeName=AttributeName Operator Value
```

Example:

```
[ObjectDefinition]
```

```
MyWeld=Component=Weld
```

[ObjectDefinition] is the section name in the .ini file. **MyWeld** in the example is the object type name, which can be freely defined. **Component** is an attribute name, which must exist in the design review session. The “=” character after **Component** is the operator. The operator may be “=” and “<>” for equality or “like” and “not like” when using wildcards. **Weld** is the attribute value.

The example defines that an object type **MyWeld** exists for the objects, whose attribute **Component** equals the value **Weld**. Users can build rules to ignore objects of type **MyWeld** using the following syntax in the .ini file:

```
[IgnoreObject]
```

```
MyWeld=1
```

The .ini file name is `3D PDF Engine.ini` and is copied automatically from the installation template to the folder of the design review session loaded in **3D PDF Engine**. By default the following definitions exist in the .ini file to ignore welds of SmartPlant 3D sessions:

```
[ObjectDefinition]
```

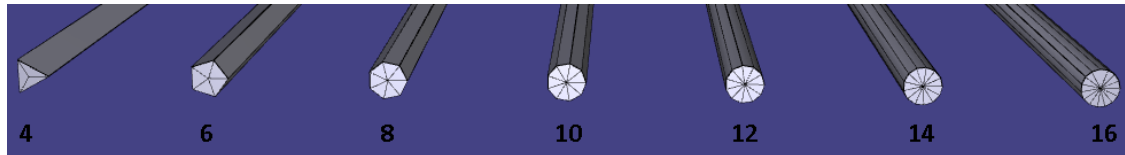
```
Weld=Component=Weld
```

```
Weld1=Commodity type Like *weld*  
[IgnoreObject]  
Weld=1  
Weld1=1
```

Quality of graphics

The file size of resulting PDF files also depends on the quality (i.e. mesh density) of the graphics.

The screenshot below shows the quality changes of the same pipe with different **Stroking tolerance** values (**Stroking tolerance** is a graphics quality setting in **SmartPlant Review**).



A higher stroking tolerance results in a better 3D PDF file, but causes a large number (> 20,000) of objects and will affect the performance while opening and viewing 3D PDF files. For design review sessions with a large number of objects, it is better to strike an acceptable balance between the graphics quality and the viewing performance.

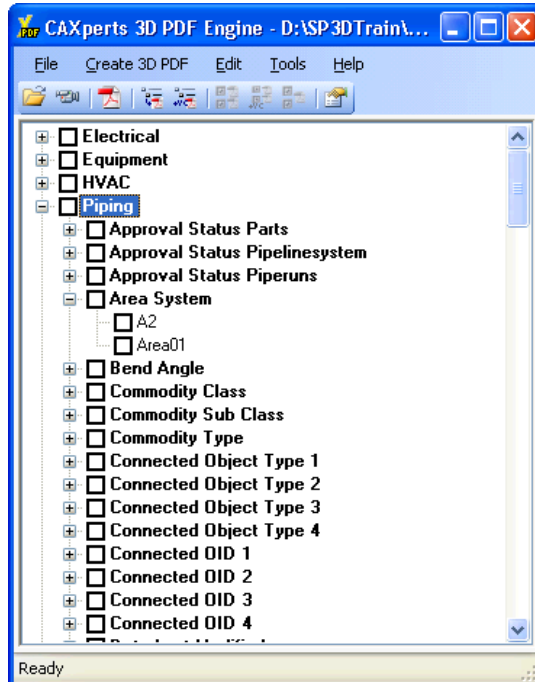
There are five levels of graphics quality. For each of the quality levels, the **Stroking tolerance** can be set for each of the custom object types in the file 3D PDF Engine.ini individually. For example:

```
[ObjectDefinition]  
MyPipe=Component=Pipe  
MyValve=Piping model code like *Valve*  
[StrokingTolerance3]  
MyPipe=10  
MyValve=8  
Others=12
```


The example defines the quality level of the objects where **StrokingTolerance1** to **StrokingTolerance5** represent the low to high quality levels. A stroking tolerance value of 10 is set for the objects defined with the name MyPipe, and a stroking tolerance value of 8 is set for the objects defined with the name MyValve. All other objects, which do not belong to the defined objects, will be set with a stroking tolerance value of 12. **Graphics Storage** will apply these settings while capturing graphics.

3.3 Creating the PDF file

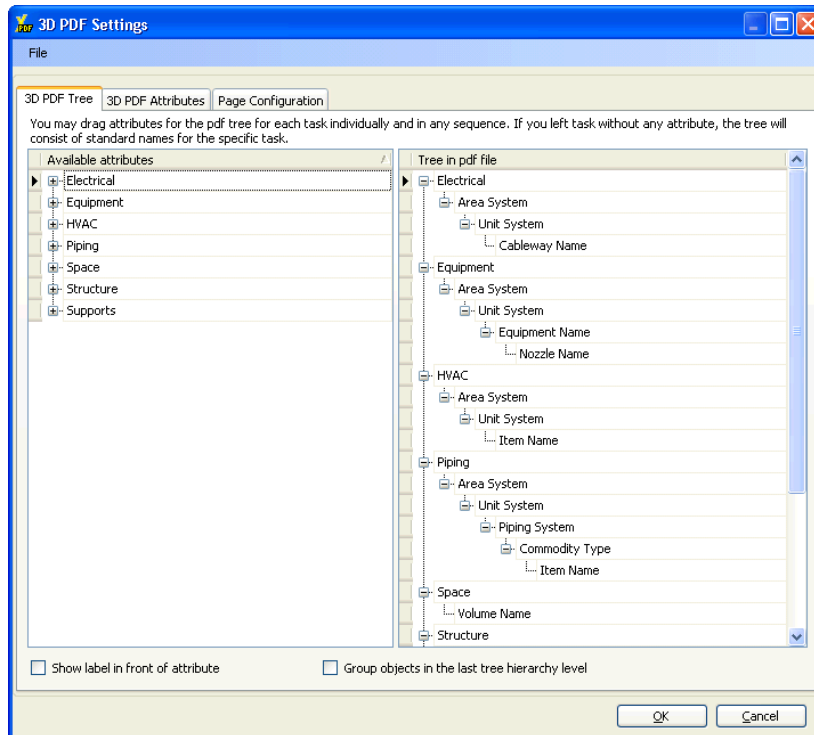
After the graphics were captured, the session tasks/disciplines and attributes will be shown in a tree view.



Afterwards the user can build up the export tree hierarchy with drag & drop of nodes on the tree view.

 Note: If there are any display sets defined in the session, a root node **Display sets** will be shown in the tree hierarchy in order to create PDF files of the display sets.

The tree hierarchy and attributes in PDF file can be configured in the **3D PDF settings** dialogue (**Tools** → **3D PDF settings**).



Afterwards, PDF files can be created by checking nodes in the tree view of the main form using the **Create PDF** menu (see 5.1 *Create 3D PDF*).

3.4 Using the PDF file

Please refer to the *Working with 3D PDF files* document.

3.5 Command line mode

3D PDF Engine can also be used in command line mode, e.g. to capture the graphics and to create PDF files automatically from a batch script. Use the following command to show the command line arguments:

```
C:\>"C:\Program Files\CAXperts\3D PDF Engine\3D PDF Engine.exe" /?
```

Command line arguments:

```
"C:\Program Files\CAXperts\3D PDF Engine\3D PDF Engine.exe" /session SessionPath /output PdfFilePath /config IniFilePath
h) /capture /quality 1-5) /fromscratch]

/session SessionPath - Create 3D PDF file for the session.
                      SessionPath is the path of a SmartPlant Review File (*.dri;*.vue;*.svf).
/output PdfFilePath  - Output PDF file path.
/config IniFilePath  - Optional, the ini file path of 3D PDF settings.
                      If not defined, the last configuration of the session will be used.
/capture              - Optional, capture the graphics of the session.
                      If not defined, do capture only if the captured graphics is not up-to-date.
/quality 1-5         - Optional, the session will be captured with quality 1 to 5 representing the low to high quality.
                      If not defined, the last value of this option will be used.
/fromscratch          - Optional, the session will be captured from scratch.
                      If not defined, the last value of this option will be used.
```

Example:

```
"C:\Program Files\CAXperts\3D PDF Engine\3D PDF Engine.exe" /session
"c:\temp\MadisonPlant.vue" /output "c:\temp\MadisonPlant.pdf"
```

or

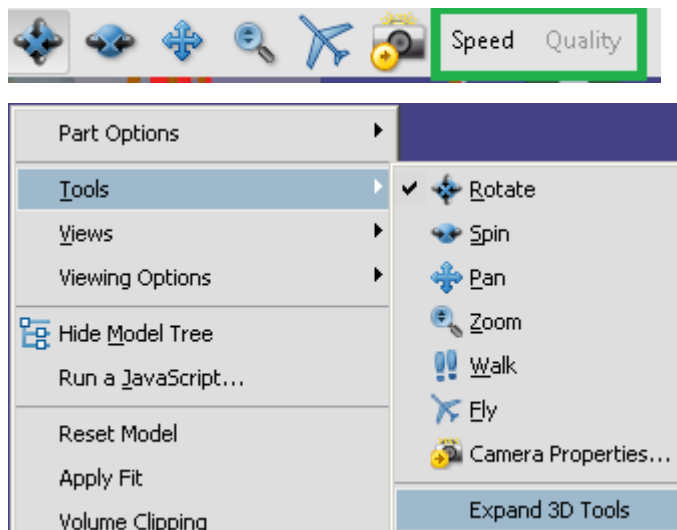
```
"C:\Program Files\CAXperts\3D PDF Engine\3D PDF Engine.exe" /session
"c:\temp\MadisonPlant.vue" /output "c:\temp\MadisonPlant.pdf" /config
c:\temp\a.ini /capture /quality 3 /fromscratch
```

3.6 Performance mode (speed/quality, for advanced users)

Viewing a 3D PDF file with a large amount (over 20,000) of objects can cause some performance issues. Therefore you can choose between speed and quality mode:

Speed mode: Turns off the display of some objects (high vertices/object length ratio) to improve the performance.

Quality mode: Shows all objects.



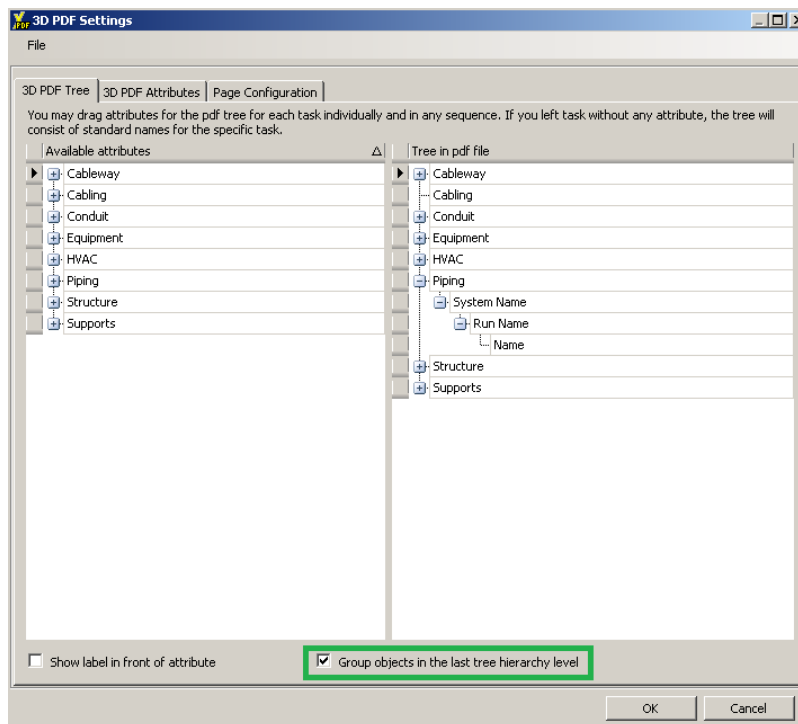
The speed/quality feature will be shown only if the PDF contains more than 20,000 objects. The 20,000 is the threshold value **ObjectCountThreshold** which can be defined in the 3D PDF Engine.ini file in the session folder. Only if the number of objects is larger than this value, the Speed and Quality buttons will be shown on the toolbar (if not, please expand 3D Tools using right mouse context menu). In the Speed mode, one can also define which percentage of objects should be invisible. Equipment will be always visible, also in speed mode.

```
[PerformanceMode]
ObjectCountThreshold=20000
MaxReductionPercentage=70
```

3.7 Group objects in the last tree hierarchy level (for advanced users)

The time of opening a 3D PDF file depends mostly on the amount of objects. Grouping several objects to one object will not reduce the graphical details, but will reduce the number of objects, and therefore, will reduce the opening time of 3D PDF files.

To group the objects the option "Group objects in the last tree hierarchy level" should be checked in the 3D PDF settings dialog. As an example the following screenshot shows how to group objects with identical Run Name (if they have the same rendering material in **SmartPlant Review**):



Each attribute of the grouped objects will be displayed with three unique values (if there are any) separated by commas.

Important objects, e.g. valves in a Pipe Run, can be excluded from the group. To achieve this, the following configuration should be done in the 3D PDF Engine.ini:

[ObjectDefinition]

Valve= Piping model code like *Valve*

[Piping_DoNotGroup]


Valve=1

Complete disciplines or tasks can also be excluded from the group function. E.g. to avoid grouping the objects of task Equipment use the following code:

[Task_DoNotGroup]

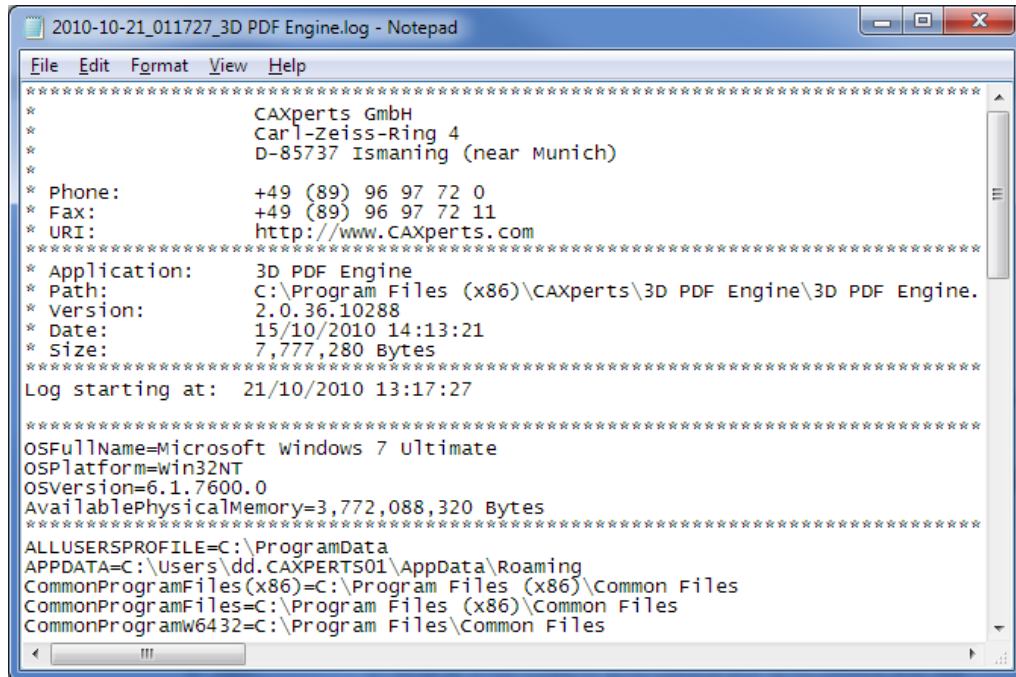
Equipment=1

As default, objects of task Equipment will not be grouped.

 Note: If objects are grouped, they will lose the links to the corresponding objects of P&ID and Iso drawings.

4 Log files

The software creates log files in the local TEMP directory (e.g. “C:\Temp\3D PDF Engine\”). The user can also open these files by double-clicking on the CAXperts **3D PDF Engine** status bar:



5 Appendix (Graphical User Interface)

5.1 Menu

File

Open project

The menu item **Open project** brings up an open file dialogue where the user can open

- SmartPlant Review Interface Files (*.dri, *.vue, *.svf)

Recent projects

The menu item **Recent projects** shows a list of recently used projects, when the user clicks on an item on this list, the software will open this project.

Exit

The menu item **Exit** closes the application.

Create 3D PDF

Create a 3D PDF file for the selected item

Creates a single PDF file for the selected tree node.

Create a 3D PDF file for the selected item using volume clipping

Creates a single PDF file for the selected tree node and shows a volume clipping dialogue to specify the volume clipping around the objects to export.

Create a 3D PDF file for the complete plant

Creates a PDF file for the complete plant.

Create a 3D PDF file per checked item

Creates a PDF file per checked tree node.

Create a 3D PDF file per checked item using volume clipping

Creates a PDF file per checked tree node and shows a volume clipping dialogue to specify the volume clipping around the objects to export.

Create a 3D PDF file for all checked items

Combines all checked items in a single PDF output file.

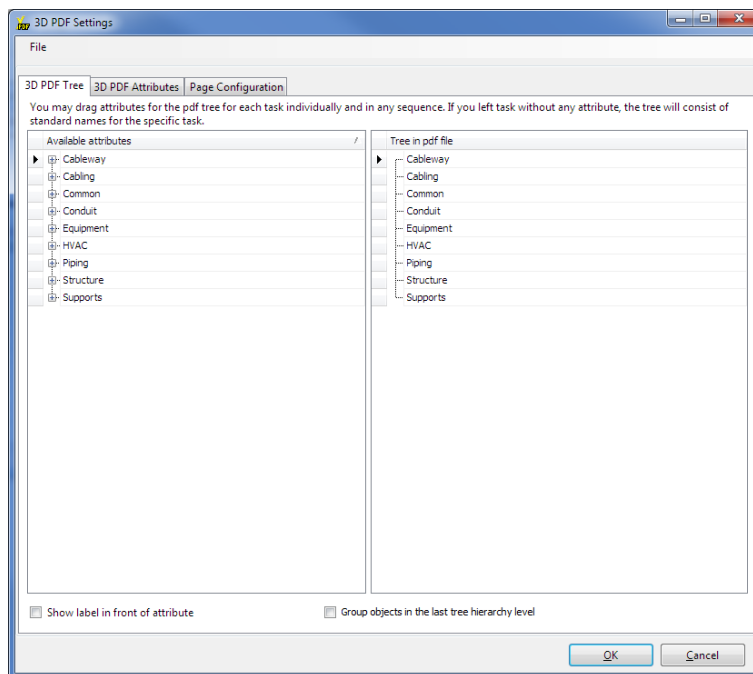
Edit

Search in attributes tree

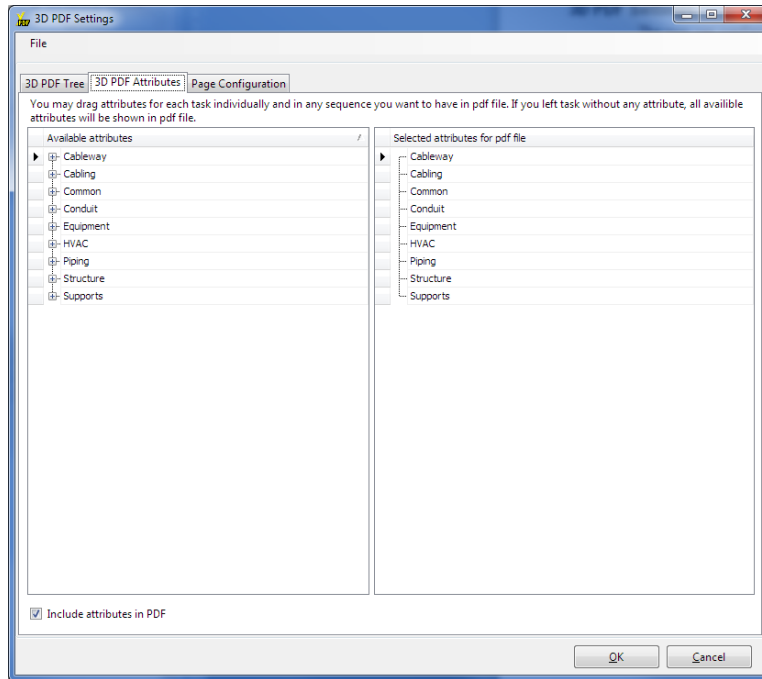
Tools

3D PDF settings

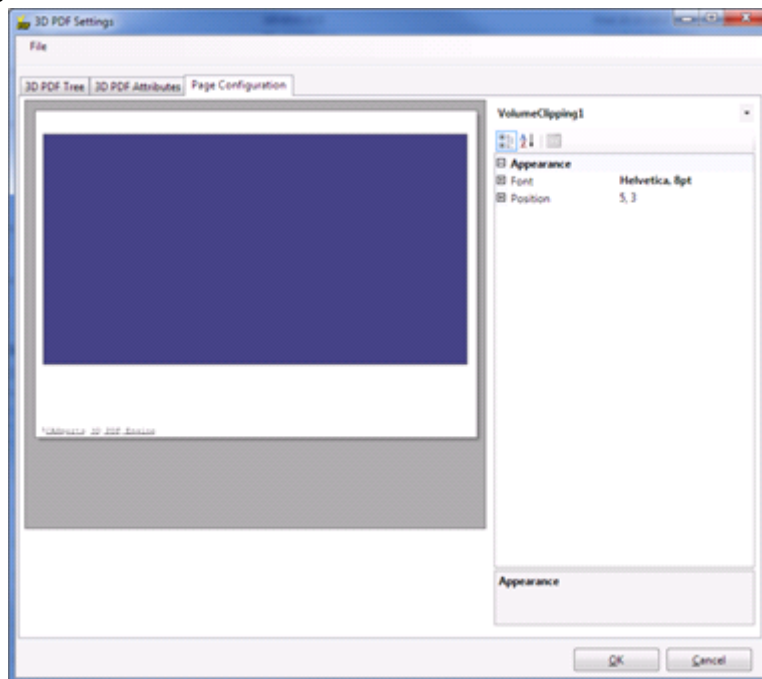
The user can configure the project tree in the resulting PDF file by dragging and dropping attributes from **Available attributes** to **PDF model tree**.



The inclusion of plant item attributes in the PDF file can be configured using the 3D PDF attributes tab. The user can drag and drop attributes that shall be included from the left list to the right one:



Page configuration



The **Page configuration** tab is only for administrators to configure the appearance and settings of the generated 3D PDF output file. In the drop-down box in the upper-left corner, several objects can be selected and modified using the property grid.

Page object

Click on the page to select this object: Page1 configures the height and the width of the generated PDF file.

Graphics object

Administrators can configure here the location and the appearance of the U3D graphics view.

Both the size and location can be adapted either by using the handles at the view borders or by modifying the numbers in the property grid.

Text object

This field allows for the addition of a custom text field on the first page of the 3D PDF file.

Image object

Here the administrator can define the source file for an embedded image e.g. a company logo.

Help

Help

The menu item **Help** opens the **3D PDF Engine** documentation (i.e. this PDF file).

Update licence

The menu item **Update licence** brings up the Update Licence form. On how to install a licence key please refer to chapter *0.0 Setup* command line (for administrators)

The following command line options are supported by the installer:

/S

Allow an install/uninstall to be run in silent mode. As a result, no screens or dialogs will be shown.

For example:

```
"C:\output\setup.exe" "/S"
```

/U:<<XML config file>>

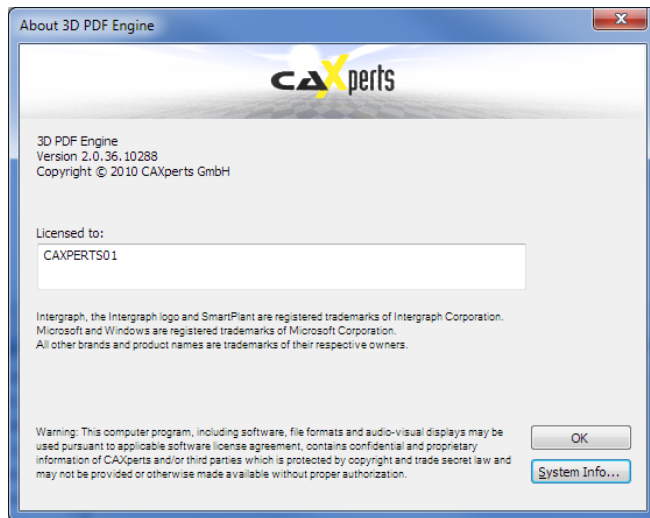
This command line option must be used when calling the uninstall program from the command line. This command also has an optional XML file that can be passed containing session variable values. For example:

```
"C:\Program Files\MyProduct\uninstall.exe" "/U:C:\Program Files\MyProduct\irunin.xml"
```

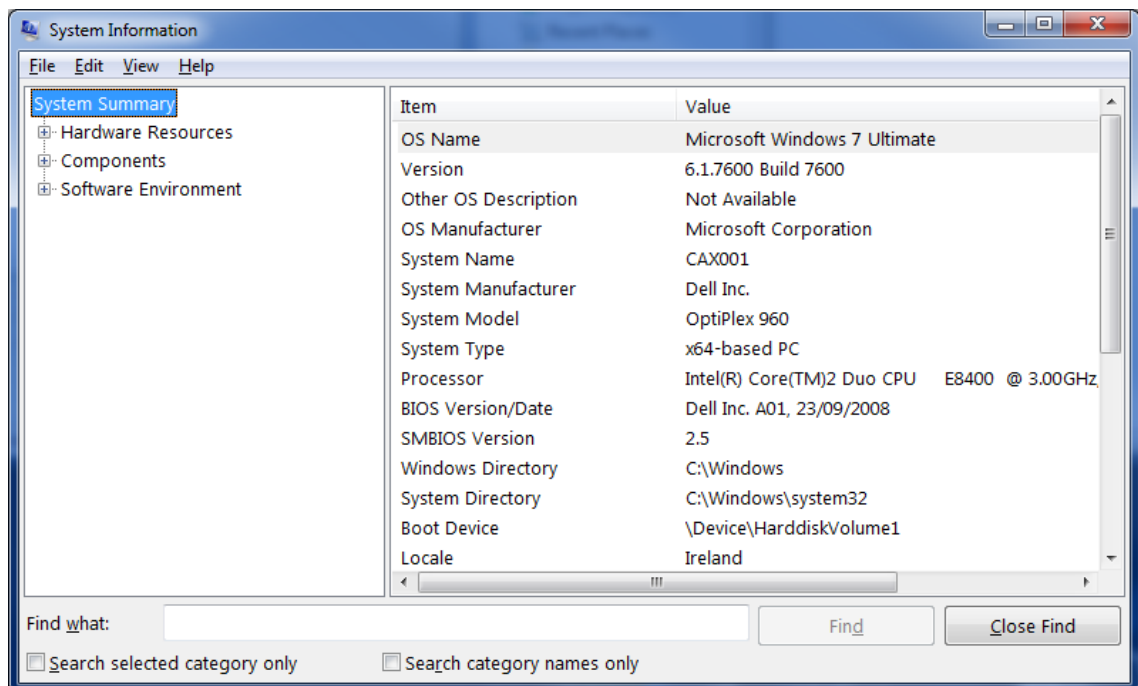
Licence.

About

The menu item **About** shows the About form, which contains information about this software product:



Click **OK** to close the form. The button **System info** brings up the Windows System Information:



5.2 Status bar

The status bar shows information about the current state of the software (e.g. progress bars). If you double click the status bar, the log file opens (see *4Log files*).

6 Technical support

Need more help? Contact CAXperts support by email, online, or phone:

<mailto:support@caxperts.com>

http://www.caxperts.com/component/option,com_contact